

KNOWLEDGE

VOL 1 MARCH 2007

OFFICIAL SAFETY MAGAZINE OF THE U.S. ARMY

WEATHER THE STORM

WHAT TO DO IN SEVERE WEATHER

» **FLIGHT INTO IIMC** p. 12

» **DUST IN THE WIND?** p. 18

» **SPRING FEVER!** p. 18



LOW-RISK FLIGHT?
how leader engagement saves lives

p. 16



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Leading on the Edge

- 2 From the DASAF
- 4 Weather the Storm
- 8 Three Time's a Charm

12 FLIGHT INTO IIMC

- 10 Dust in the Wind?
- 11 Browned Out and Confused
- 14 Restricted Flight
- 16 Just Another Low-risk Training Flight?

- 18 Spring Fever!
- 24 Too Heavy+Too Fast= Three Dead

20 FULL SERVICE, PLEASE

- 26 As Good as It Gets
- 26 TRIPS for Your Trips!
- 28 Accident Briefs

Plus: pull-out posters



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Knowledge is published monthly by the U.S. Army Combat Readiness Center, Bldg. 4905, 5th Ave., Fort Rucker, AL 36362-5363. Address questions regarding content to the editor at DSN 558-1218 (334-255-1218). To submit an article for publication, e-mail knowledge@crc.army.mil or fax DSN 558-9044 (334-255-9044). We reserve the right to edit all manuscripts. Address questions concerning distribution to DSN 558-2062 (334-255-2062). Visit our Web site at <https://crc.army.mil>.

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POSITIVE ENGAGEMENT SAVES LIVES

The Combat Readiness Center is often remiss in passing along the great work our Army is doing and sharing with our teammates our collective "good news stories." It's well worth mentioning and remembering the multitude of successes of our Army and, just as important, looking at acquired lessons learned to ensure we incorporate them in our next event.

While the USACRC can tell you exactly how many Soldiers are lost in accidental fatalities, what's impossible to pass along are the many, many Soldiers your direct leadership has "saved." As an "Army Strong" formation, we do many things well. Please allow me to discuss some of these great things our Army is executing.

The attention and awareness level focused on identifying and mitigating risk in all we do is as high as anytime in my years of service. This energy and willingness to "engage" is evident from our most senior-level leaders down to and including the youngest Soldiers in our basic and advanced individual training. I personally spoke with

and observed young Soldiers, cadets and our civilian teammates that are proactive and adamant in their roles, missions and contributions as "part of the solution set versus part of the problem."

While we expect the involvement of leaders in day-to-day risk mitigation, the good news is most of our younger Soldiers are absolutely involved and understand that complacency and overconfidence are dangerous.

Engaged leaders promoting and executing the Motorcycle Mentorship Program dropped our Army's motorcycle losses by some 50 percent. Weekly, the USACRC receives personal accounts from Soldiers that attribute training, adherence to

standards, and our Army's active engagement in this most "worthwhile program" to saving lives.

Included in this issue of *Knowledge* is an article about a crew whose Bradley Fighting Vehicle rolled into a rain-swollen canal in Iraq. While

survived and escaped without serious injury.

Why did this crew make it when many before did not? We attribute their success to a combination of things: training, survival equipment and pre-combat checks and



the BFV was crossing a bridge, the road beneath collapsed. This and and like scenarios, are played time and again with BFVs, HMMWVs and M1s and, more often than not, with disastrous consequences for the lives of our Soldiers. This time, however, the outcome was different. All three Soldiers

procedures. But when it comes down to it, the individual Soldiers themselves made the difference by correctly applying their training and experience gained under the watchful eye of an "engaged leader."

Training and experience also were evident in our last two catastrophic Class A

“It's EVIDENT our Army clearly UNDERSTANDS the “No. 1 Most Effective Tool” in our vast array of “things we use” to MITIGATE LOSSES and make a difference in saving lives is ENGAGED LEADERS AT ALL ECHELONS.”

FROM THE DASAF

aviation accidents, where numerous personnel successfully egressed from an otherwise totally destroyed aircraft. In another event, when an AH-64D in Iraq was hit by enemy fire and rendered unflyable, the crew was able to quickly diagnose the damage and remarkably land the nearly-destroyed aircraft. They were quickly recovered by a sister aircraft operating in the immediate area.

These two examples demonstrate how aviators used their training to great effects. These successes by our aviators contribute to an overall decrease in accident rates and aircraft losses the Army is experiencing in fiscal 2007.

Leadership is evident in every aspect of what our Soldiers execute throughout the world. It's evident our Army clearly understands the "No. 1 Most Effective Tool" in our vast array of "things we use" to mitigate losses and make a difference in saving lives is ENGAGED LEADERS AT ALL ECHELONS. All that said, we can do better.

These accidents and the actions of our crews reinforce the importance of direct leadership engagement, training and executing to standard. Doing the correct thing when no one is watching will save lives. While you can't dictate outside forces such as the weather or the enemy, you can control your actions inside your vehicle, cockpit or living area and turn a bad situation into a survivable one.

Be a leader, act as a team and stay engaged to stay alive!

ARMY STRONG!!!!

William H. Forrester
Brigadier General, USA
Commanding

March 2007 **KNOWLEDGE** <https://crc.army.mil>

As Soldiers, we have to be prepared for any threat we might encounter in the field. With the spring and summer months just around the corner, we can soon expect to see a variety of weather-related hazards in our training and operational environments. One of the most common weather events encountered in the field is thunderstorms, which can include hazards such as lightning, tornadoes and flash floods. Let's take a quick look at each of these hazards individually.

WEATHER the STORM

SFC RAYMOND HAMILTON
173rd Airborne Brigade
Bamberg, Germany

Lightning

Since fiscal 2002, at least 21 Soldiers have been injured by lightning strikes, including one Soldier who died from his injuries. If you're caught outside in a thunderstorm with lightning, seek shelter in a sturdy structure or hardtop vehicle. If you find yourself in a metallic-type vehicle, sit with your hands in your lap.

If possible, shut off electronic communications equipment when lightning is in the area and don't use it unless you have to. If you're inside a building equipped with a telephone, don't use it either unless absolutely necessary. Avoid large pieces of metallic equipment, and make risk decisions concerning vehicles loaded with various

types of explosives or ammunition. Each type of explosive and ammunition has a different explosive radius for fragmentation and damage. Keep this in mind when making a call on how far to clear away.

When caught in the open with no place to go, ensure you're not close to tall trees or structures that are the highest points in the area. In wooded areas, seek shelter under a thick growth of small trees. Avoid tall objects, isolated trees, bodies of water, sheds and fences. If you're part of a group, spread out and squat down in an attempt to keep as low a profile as possible while keeping both feet planted firmly on the ground; never sit or lie on the ground. The tactical situation dictates

other types of mitigation. For instance, radio operators should take down long whip antennas to help create a low profile.

Fighting positions create a unique point of interest. During lightning storms, make sure you're not leaning or resting your body on the inside of the hole. Center yourself and remain alert until the storm passes. A properly constructed fighting position will

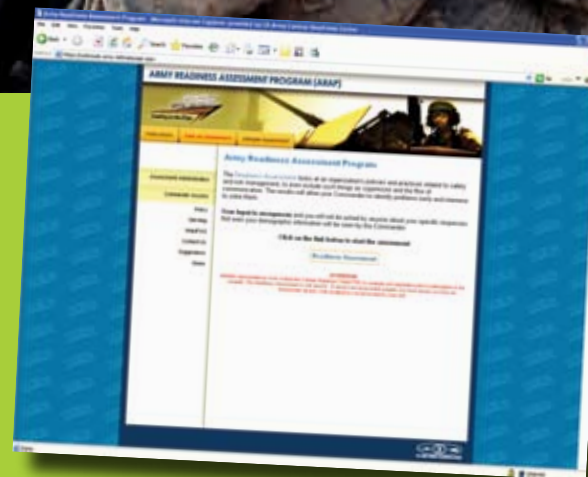
provide you with overhead cover from hail and high winds and you'll have the lowest profile possible.

Keep in mind most lightning strikes occur after a thunderstorm has passed. Wait about 30 minutes after the storm passes to resume activities. A general rule of thumb in estimating the hazard area for lightning strikes is flash-to-bang time. If you see lightning,

begin counting seconds; if you hear thunder within 30 seconds, you're in a hazard area. Get into the "lightning safety position" by squatting down near the ground with your heels touching and your hands over your ears.

FYI

Before the next storm hits, make sure your Soldiers are ready for the mission and use the Army Readiness Assessment Program. It's a Web-based initiative that provides battalion-level commanders with data on their formation's readiness posture. Check it out today at <https://unitready.army.mil/>.





Tornadoes

Tornadoes are violent atmospheric storms with winds ranging from 200 to 300 mph in the most severe cases. If you or your unit is caught in the field when a tornado hits, follow these guidelines:

- Seek shelter immediately.
- Avoid trailers or vehicles.
- Never attempt to outrun a tornado in a vehicle; instead, abandon it immediately.
- Seek shelter in a substantial structure and go to the basement or an interior room.

If no shelter is available and you're caught in a convoy, dismount your vehicle and lie flat in the nearest ditch or depression. Be sure to secure your Kevlar helmet and other protective items to prevent injury from flying debris. In a defensive position or base camp, a properly constructed fighting position will place you below the ground with overhead cover if suitable structures aren't available.

Flash floods

Flash floods are another hazard associated with storms, and you don't even have to be in the area receiving the rain for this particular hazard to strike. When selecting operational sites, stay clear of low-lying areas, dry riverbeds, flood plains and canyons. If you're caught outside in a flash flood, move to higher ground immediately. Avoid rivers, streams and low spots. Don't try to walk through flowing water higher than ankle deep and never attempt to drive through flooded areas. Underwater hazards aren't visible, and water more than 1 foot deep can easily displace 1,500 pounds. Just 2 feet of water will move or carry most automobiles!



What else can you do?

Whether you're in the field or in garrison, the best method for maintaining environmental situational awareness is to monitor weather reports. This usually is accomplished in the field via the chain of command and tactical operations centers receiving routine weather data

“Whether you're in the **FIELD** or in **GARRISON**, the **BEST** method for **MAINTAINING** environmental situational awareness is to monitor **WEATHER REPORTS.**”

as part of operations. However, if the National Weather Service has deemed weather severe enough to put out a watch or warning, your chain of command usually will provide more guidance on unit actions. If you don't have access to immediate weather data, you can rely on your own judgment and still

take appropriate measures to prevent or limit the risk to you and your Soldiers.

These are just a few general tips. Depending on your particular circumstances, you might want to conduct further research into what you can do as a leader when faced with changing weather that might affect mission outcome. «

DID YOU KNOW?

Since fiscal 2002, at least 21 Soldiers have been injured by lightning strikes, including one Soldier who died from his injuries.

- A Soldier was killed by a lightning strike while erecting a tent that had blown over during a storm. The Soldier died at a local medical facility. Four other Soldiers were struck in the same incident, but none suffered serious injuries.

- Three Soldiers training small unit tactics in a wooded area were injured when lightning struck a nearby tree. All three Soldiers were knocked to the

ground. The first Soldier to regain consciousness immediately evaluated the other Soldiers and found one wasn't breathing. The Soldier called for help on his radio and began CPR on the injured Soldier. After approximately two cycles of CPR, the injured Soldier started breathing on his own.

- Three Soldiers were injured when lightning struck near their observation point. All three Soldiers were hospitalized.

- A Soldier was directing vehicle traffic on a parking apron when lightning struck the wet ground about 10 to 30 feet from him. He immediately began convulsing and vomiting.

The Soldier was taken to the emergency room, where he was treated and held several hours for observation. The Soldier was not near or holding any metal objects at the time of the strike.

- A Soldier suffered facial injuries after being struck by lightning. The Soldier had been walking across a road during inclement weather when a lightning bolt struck the ground nearby and caused him to fall on his face. The Soldier was unconscious until he arrived at the hospital about 20 minutes later with an injury to his left eye, upper lip, teeth and nose, as well as internal injuries.

- A Soldier was burned after being struck in the head by a lightning bolt. The Soldier was dazed but coherent after the strike and recognized what had happened. The Soldier was checked for injuries by a medic before being transported to the emergency room.

- Eight Soldiers suffered various injuries when they were struck by lightning during annual training. The Soldiers were seeking shelter from a thunderstorm underneath a tarp when lightning struck three trees about 50 feet from their position and traveled at



ground level until reaching them. Three of the Soldiers were hospitalized, while five others were treated and released.

- A Soldier was burned after being struck by lightning while walking across an airfield tarmac. The Soldier didn't have a pulse and wasn't breathing when he was found by a Department of the Army

Civilian, who revived him.

- A Soldier suffered a head injury after being struck by lightning while talking on the telephone. The Soldier was sitting in a 5-ton vehicle during a severe thunderstorm and was trying to contact his supervisor via land line when an electric current came through the phone.

THREE TIMES A CHARM

BOB VAN ELSBERG
Editor, *Knowledge*
U.S. Army Combat Readiness Center

Think your chances of being zinged by lightning are about the same as being abducted by aliens? Think again. Perry Humble, a retired Army aviator, tells how he went three rounds with the big “zapper” and lived to tell the tale.

Round One—Hosed!

When you live in southern Alabama, it's nice every so often to wash your car so you remember what the paint looks like. If it's a summer afternoon and you time it just right, Mother Nature will often send a brief monsoon for your “final rinse.” Rain, however, isn't the only thing she sends from the skies. As Perry was scrubbing his car one afternoon, he heard the rumble of thunder. He decided curtailing his car washing sooner

rather than later was the best course of action and headed across the yard to the spigot. Little did he know he was in for an “enlightening” experience.

“I was reaching down to turn off the spigot with my left hand while holding the nozzle in my right hand. As I turned the spigot, I saw a flash and heard a loud boom.”

When he woke up, he was on his back several feet from the spigot with his dog howling next to him. He checked himself for burns but found only

a little white dust on his fingertips. His heart was OK, but that didn't mean he'd escaped unscathed. The jolt tightened his muscles so badly he could barely open his hands.

And just how did Perry get zapped? Lightning hit the water main and traveled through his plumbing to the spigot.

Lessons learned: If you can hear thunder, you're within range of lightning. Avoid all water sources in and around your home.

Don't take baths or showers and stay away from all water fixtures, including the toilet.

Perry survived round one, albeit zinged and slightly dinged. However, they say people who've survived a close call with lightning attract future bolts like a magnet. That, or maybe it's just lightning trying to finish the job.

Round Two—A special “afterglow”

Perry's second experience came after he'd left active duty and

was helping his dad move mobile homes. He and a friend were splitting a doublewide in half so it could be moved. While his friend removed the cap on top of the trailer, Perry, wearing leather gloves and rubber-soled boots, knelt on the ground, separating the halves with a hydraulic jack. Behind him stood several oak trees with exposed roots, some running beneath the trailer. Suddenly his partner yelled, “There's a thunderstorm coming—put the trailer back together!”

Perry frantically worked the jack to rejoin the halves to prevent rain from damaging the interior. Suddenly, there was a loud boom as lightning hit one of the trees behind him. The bolt went through the tree's roots and into the mobile home. Perry said the sight was surreal.

“I saw what looked like electricity running through the trailer's frame rails and axles. It went through the jack, up the handle and covered my right arm.”

The charge knocked him backward, but he wasn't hurt. However, not wanting to tempt fate, he jumped into a large truck to wait out the storm.

Lessons learned:

Trees aren't stingy; they'll share the wealth if you're nearby when lightning strikes. Also, it pays to wear personal protective equipment

like heavy gloves and rubber-soled boots if you work outdoors.

Perry finished round two with a new appreciation for how effectively tree roots conduct electricity, especially when there's an inviting metal object nearby. However, lightning wasn't done with him yet. Not discouraged after two near misses, it took a shot at him where he thought he was safest.

Round Three—You can run, but you can't hide!

Perry was in his workshop with his son one afternoon when a storm appeared suddenly. Concerned about

settling on the floor throughout the house,” Perry said. “You could feel the electricity tingling, like when your hair stands on end.”

Round three, fortunately, didn't result in injuries or damage—but it was scary!

Lessons learned:

In the Southeast, dry, sandy soil can keep normal lightning rods from working well. More extensive systems such as buried wire loop encircling a house and surge protectors between the utility meter and home might be needed.

Will there be a fourth round? Only time will tell. However, to keep lightning from knocking you out, the National

possible, find shelter in a substantial building or in a fully enclosed metal vehicle. Make sure the vehicle's windows are shut completely.

■ If lightning is striking nearby, crouch down and put your feet close together. Cover your ears to minimize hearing damage from thunder, and stay at least 15 feet away from other people.

If indoors

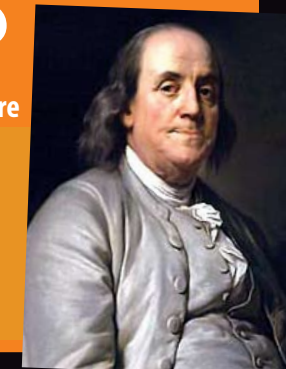
■ Avoid water and stay away from doors and windows.

■ Don't use land-line telephones or wear headsets.

■ Turn off, unplug and stay away from electrical appliances, computers, power tools and TV sets. Lightning might strike

DID YOU KNOW?

Ben Franklin came up with the idea of lightning rods more than 200 years ago, and this invention has helped save millions of homes from damaging or deadly strikes. For more information on home lightning protection, visit this University of Florida Web site: <http://www.napa.ufl.edu/2002news/lightningrod.htm>.



tornadoes, he and his son beat feet to their home. Running through the rain, they flew through the kitchen door and into the living room. As they did, lightning either hit the house or very near it. What happened looked like something from a Stephen King movie.

“There was a waist-high, gray-purple haze

Lightning Safety Institute offers the following tips:

If outdoors

■ Avoid water, high ground and open spaces.

■ Avoid all metal objects including electric wires, fences, machinery, motors and power tools.

■ Avoid taking shelter beneath canopies, small picnic or rain shelters or near trees. Wherever

exterior electric and phone lines and send a powerful electric shock inside a building.

Finally, just because the sky is clear doesn't mean you're safe. Wait at least 30 minutes after the last flash or boom before resuming normal activities. ⏪

DUST IN THE WIND?

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2nd Brigade Combat Team
1st Infantry Division
Schweinfurt, Germany

Mother Nature can be ruthless, particularly in the desert. Even our Army, the most mobile and powerful in the world, must bend to her power, especially during sandstorms. Sandstorms have a negative impact on personnel and equipment readiness, and any type of operation during such conditions is dangerous. You can protect yourself and get the mission done, however, even during the worst of conditions.

Sandstorms occur frequently on the Arabian Peninsula and are most common in April. These storms are created by strong, dry winds that blow close to the desert's surface. The heat of the desert terrain causes the winds to become stronger and hotter. Throw in a cold front and tornado-like forces suddenly appear, complete with howling winds and swirling sand.

A sandstorm's leading edge creates a wall of dust that reduces visibility to near zero. Driving in Iraq is already dangerous even in the best of conditions.

The probability of an accident increases when you factor in a sandstorm and near-zero visibility.

Operating vehicles during a sandstorm is extremely difficult, so the optimum choice is to stay put on your base or in a safe place. However, if the mission must go on, drive slowly. Wear goggles with the clear or yellow-tinted lens insert to protect your eyes. If you don't have goggles, wear any type of eye protection that might be available.

Thermal imaging devices provide vehicle and tank drivers better visibility during

sandstorms. An Army News Service story explained the benefits of these devices to Soldiers at the beginning of the Iraq conflict.

"During the infamous Iraqi sandstorms ... our Army had very limited visibility," the story read. "Soldiers in Iraq discovered they still had good visibility with their individual and crew-served thermal weapons sights, even when the sandstorms obscured nearly every other optical sensor."

Communication during sandstorms is problematic. Sometimes the wind and blasting

noises make communication between crewmembers and other Soldiers nearly impossible. Even so, drivers, co-drivers and vehicle commanders must communicate with one another. Situational and environmental awareness is vital to Soldier safety during sandstorms, especially in moving vehicles. Drivers and vehicle commanders must use the scanning method while driving during these storms.

Sandstorms also present physical dangers to Soldiers. Blowing sand can make breathing difficult, and fine sand particles cause a hacking cough. Place a T-shirt or cloth over your nose and mouth to help you breathe and protect your airway. Close all vehicle vents and place sand bags or other material over any openings. Both these measures are important because sand and dust within the Persian Gulf region can carry infectious diseases, so protect your airway as much as possible.

Sandstorms aren't a force to be taken lightly. Be prepared and know the proper techniques to prevent an accident and protect yourself when sandstorms strike. <<

BROWNE D OUT AND CONFUSED

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Fort Rucker, Ala.

Numerous Army studies conducted over the years show spatial disorientation plays a significant role in the number and outcome of rotary-wing accidents. Although these studies have provided valuable insight into this problem, until recently SD had never been studied specifically in combat. To fill this information void, the U.S. Army Aeromedical Research Laboratory evaluated summaries of all Class A through C Army rotary-wing accidents in operational areas (excluding loss from enemy action) from October 2000 to June 2005.

The results of our study were disturbing. Although the rate of SD-related accidents in training was about 27 percent of all Class A through C accidents, that number jumped to 37 percent in combat. Not only have these accidents become more frequent, they've also become more lethal and expensive. Of the 151 accidents studied, 56 were directly attributed to SD and killed 45 Soldiers while injuring almost twice that number. The rate of nearly one death per SD accident in combat is more than double that seen in CONUS training accidents. The high financial cost of \$5.96 million per accident, which is three times the cost of accidents not attributed to SD, reflects the high proportion of destroyed aircraft.

Why are SD accidents so lethal and expensive? The answer probably lies in the environmental conditions in which most of our combat flying has been conducted over the last few years. The majority of SD accidents we studied occurred in phases of flight close to the ground, and 34 of the 56 accidents (61 percent) were caused by brownout. Another piece of supporting evidence regarding environmental

conditions is just as many accidents are happening during the day as at night. Before we began operations in these dusty countries, the overwhelming majority of our SD accidents happened at night.

The obvious association here is restriction of an aircrew's visual cues. Anyone who's ever landed in a desert knows vision suddenly is lost when a dust cloud catches up to the aircraft. Our analysis showed numerous crews continued their maneuvers despite losing all visual reference and crashed as a result. These crews became acutely disoriented and didn't deal with what can be a completely overwhelming situation.

So what's the answer? There are potential technological fixes in the works, but as of yet there's no "magic bullet" that allows completely safe flight in a dust cloud near the ground. The themes that kept recurring during this study were incorrect procedures and poor crew coordination.

The first thing that stops in highly stressful situations such as flying into a dust cloud is effective communication. Crews often lose their normally excellent coordination and vital information is lost or never transmitted. Any crewmember might have the information that could save the aircraft, but they often don't say a word because the guy on the sticks appears to be "maxed out."

Crew coordination and the confidence to throw away a bad situation are the two best tools in the box to avoid a brownout accident. Enhancing those tools with good flight procedures and training gives us the best armament we have to stop people dying in the dust. <<



Keep the following tips in mind when Mother Nature decides to surprise you with a sandstorm during your desert deployment:

- Always wear protective eyewear.
- Protect your airway by placing a cloth over your nose and mouth.
- Close vehicle vents and cover all openings.
- Drive slowly.
- Communicate with all crewmembers.
- Know your route and maintain situational awareness.
- Drive with lights on to help others see your vehicle.
- If your vehicle breaks down, use it for cover from the elements. Don't leave the vehicle to search for help; the storm will end eventually.
- Be prepared for the unexpected. Always carry a kit bag, rucksack, basic issue items, batteries and food and water in your vehicle in case you break down or have to pull over.

FLIGHT INTO IIMC

BILL RAMSEY
Operations Research Systems Analysis
U.S. Army Combat Readiness Center

“During night vision goggle currency and readiness-level progression training, the crew of a UH-60L encountered instrument meteorological conditions. The aircraft entered 70- to 80-foot-tall trees in a 30-degree nose-low attitude with a 45-degree left bank angle at approximately 80 to 100 knots. The rotor system cut the trees and began to separate as the aircraft descended. The aircraft was destroyed and three crewmembers were fatally injured.”

I reflected on my past experiences as an Army aviator as I read the details of this accident. What got me through 30 years of flying without killing myself? Was it the training I'd received, my flying skills or just plain luck? Unplanned or unintentional

flight into clouds in deteriorating weather continues to be a root cause of Army flight accidents. Since January 1997, 13 IMC-related accidents have claimed 41 lives and cost the Army nearly \$209 million. Flying is serious business. If you're going to fly an aircraft in marginal visual flight rules conditions, you have to be proficient and confident in your abilities.

Like any other aviator, I never planned to fly into marginal conditions; but when I did, I didn't want to commit to flying instrument flight rules. I know some of you are probably thinking times are different now, with aviators operating in combat where flying higher than 200 feet will get you killed. Trust me, though, flying at 150 knots straight into the ground will kill you just as dead.

Case in point: I was flying with a first lieutenant in an OH-58D

in Iraq during Operation Desert Storm. We'd been conducting a screen line and the lieutenant was flying when our aircraft went IIMC. I was prepared for this situation, and we safely maneuvered the aircraft back into VFR conditions. We successfully joined up with our Apache and made it to the screen line without incident.

In combat, we push ourselves and our aircraft to support the troops on the ground. I went IIMC three more times under NVGs during my 9-month stint in theater, and I came back to talk about it every time. That's because I made myself fly on instruments when returning from training and support missions, used the simulator and

planned every flight as if it would be flown in marginal conditions.

“The Five Six Cs”

Several years ago, someone established “the five Cs,” a procedure to help aviators handle those first critical seconds when an aircraft flies into IMC: control, coordination, clearance, course and call. I've

added a sixth, commit, which should be your first step to ensure all the other steps work effectively. The six Cs of IMC also include those actions specified in the acronym AHTA: attitude, heading, torque and airspeed. This procedure gives the pilots something to follow when confronted with IMC.

Commit

You must commit to landing the aircraft or flying under IFR. Never attempt to re-establish visual meteorological conditions if you bump into a cloud; if you do, you're sure to end up in the accident briefs section of this magazine. I found landing to live and fight another day is better than being a statistic. If landing isn't an option, however, make the decision to fly instruments. Once you've convinced yourself that clouds aren't your enemy, you'll be able to maintain control not only of your aircraft, but also yourself.

“Flying INSTRUMENTS should become SECOND NATURE to you. Through TRAINING AND PRACTICE, you can develop critical skills and the CONFIDENCE to make your next IIMC encounter a SUCCESS.”



Control

Maintaining aircraft control is the most important factor in recovering from IIMC. You'll be in serious trouble if you fail to make this transition, and the other five Cs depend on you controlling the aircraft.

Here's where AHTA comes into play. Maintain control by leveling the wings on the attitude indicator; maintain the heading and turn only to avoid known obstacles; adjust torque to climb power; and adjust airspeed to climb airspeed.

Coordination

Before flight, each crewmember should discuss what their role will be in case of IIMC. It should be understood that the pilot on the controls will concentrate on flying the aircraft by referencing the instruments. The pilot not on the controls should monitor the pilot flying and look outside for VFR conditions and obstacles. Always remember to check your onboard navigational equipment before flight too. If the weather is marginally VFR or less, it could mean the difference between living and dying.

Clearance

Climb straight ahead to an altitude that will provide clearance over the highest obstacles along the route of flight.

Course

Select the appropriate heading and turn to it. The heading you turn to most likely will be dictated by the IMC recovery procedures at your installation.

Call

Make any required radio calls for assistance or advisories.

Training

The six-C process is a tool that can help you cope with IIMC, but tools alone will not provide you confidence in your abilities. That necessary confidence will come only through training. Training to be proficient at coping with IIMC flight is probably the single most important thing you can do to ensure your survival during an IMC encounter.

My intent here isn't to debate the issue of currency versus proficiency. However, if you only fly the minimums in accordance with your aircrew training manual and conduct the majority of your simulator and hood time toward the end of your 6-month period, you're probably current but not very proficient in instrument flying.



Instrument training should be challenging but realistic and promote aviator confidence. Your training also should reflect the kind of flying you do most of the time. Analysis shows most IIMC accidents occur at night and often under NVGs. If you're an NVG pilot and fly

DID YOU KNOW?

Knowledge is now available in a new, easy-to-use online version! Check out the magazine Web site at <https://cra.army.mil/Knowledge/index.html> to find individual articles in easy-print PDF format or download an entire month's issue for even

more safety information. You also can subscribe to the magazine through the site and even share your "war stories" with your fellow Soldiers! For more information or to provide feedback on Knowledge, e-mail the editor at knowledge@cra.army.mil.

little or no instrument training in the aircraft at night, you're playing Russian roulette with your life.

I know pilots in combat have a difficult time maintaining instrument proficiency, but sooner or later you'll find yourself inadvertent. Take every

opportunity to maintain your confidence in instrument flight. A battalion commander once told me he didn't have time for his UH-60s to be used for instrument training and besides, their mission wasn't to fly instruments anyway. Instead, they were designed

to move troops and supplies on the battlefield. He believed that until he went inadvertent and almost lost an aircraft and crew; afterward, he committed the time for his flight crews to conduct instrument training until they became proficient.

One last thought

Flying instruments should become second nature to you. Through training and practice, you can develop critical skills and the confidence to make your next IIMC encounter a success. Commit yourself to taking every opportunity to fly instruments. It might save your life, and who knows? You could be the next generation of Army aviator writing to others about what brought you home every time. «

RESTRICTED FLIGHT

GARY MORGAN
Eastern Region
U.S. Department of
Agriculture Forest Service

Every year, interagency firefighting units place temporary flight restrictions on airspace

over fires where aviation resources are needed to support ground-based units. Like fires, these airspace restrictions emerge with little warning. Besides creating distractions and hazards for ground and air units fighting the fire, aircraft that penetrate these areas put themselves and others at risk for midair collisions. Below is an excerpt from a safety communication report received on August 28, 2006, during last summer's especially active fire season.

"While working out of the Purdy Fire Helibase located at

Dubois Airport (U25), helitack personnel observed three military Black Hawk helicopters in loose formation traveling from southeast to northwest along the southwest side of the runway approximately 800 to 900 feet above ground level. At this time, helibase radio operators were notified and in turn notified the helicopter coordinator and other airborne helicopters. HLCO attempted to contact the Black Hawks on air-to-air radios without success. At this point the Black Hawks had not yet entered the fire TFR area; however, they quickly passed the airport and then continued west-northwest, climbed slightly over terrain and eventually crossed the fire entering at approximately Division X and

continued through the middle of the fire going northwest, exiting the TFR on the west-northwest side and then continued to Jackson, Wyo. HLCO was over the fire at this time along with one medium helicopter performing bucket work. The Black Hawks flew below the HLCO at approximately 500 to 800 feet AGL as they went through the fire airspace and TFR. There was a presidential TFR in place 25 miles to the west for Jackson, Wyo., at the time of the intrusion."

A review of wildland fire airspace intrusion incidents reported for fiscal 2006 showed 41 TFR violations, with 11 of those being military aircraft. In the first 8 months

of 2006, there were 79,944 wildland fires that covered 7,820,449 acres. Compared to the 10-year average of about 58,000 fires per year, 2006 was particularly challenging for interagency firefighters.

TFR information is available to all aviators to help them avoid inadvertent violations of restricted airspace due to firefighting operations and other national airspace restrictions. It's important for pilots to be aware of issued flight restrictions because of the low-level, dense operations of aircraft in a fire zone. Military aviators can help wildland firefighters maintain a safe firefighting environment by doing two things:

“It's **IMPORTANT** for pilots to be **AWARE** of issued flight **RESTRICTIONS** because of the low-level, dense operations of aircraft in a **FIRE ZONE.**”

- Before every flight, check notices to airmen and Web sites that carry the latest TFR information. One excellent source is the National Airspace Information Web site at <http://airspace.nifc.gov/mapping/nifc/index.cfm>.

- Look for signs of wildland fire such as smoke and remain well clear of the area, keeping a lookout for aircraft that might

been route to or from the fire.

For additional information on how wildland firefighters use airspace and aircraft in support of their missions, check out our airspace Web site at <http://www.fs.fed.us/r6/fire/aviation/airspace/web/index.html>. Help us keep the skies safe so all aviators and firefighters can go home at the end of their shift. «

JUST ANOTHER LOW-RISK TRAINING FLIGHT?

U.S. ARMY COMBAT READINESS CENTER

"A specific area of concern is single-ship operations, which are most often categorized as low-risk operations. Multi-ship operations, the standard in combat, lower risk by adding experience, maturity, judgment and command attention to the mission. The more aviators involved in the planning and execution of a mission, the better the preparation and decision making. When briefing single-ship operations, specific involvement by the command and mission brief authority are required to identify all hazards and have thorough, honest dialogue with crews to (1) assess the aircrews' ability to conduct the mission and (2) ensure the appropriate level of pre-mission planning has taken place."

—GEN Richard A. Cody's thoughts on aviation risk management and leadership

What started out as a low-risk, single-ship training mission in the desert ended with two deceased crewmembers, four injured service members and a destroyed MEDEVAC aircraft. The accident crew was one of two MEDEVAC crews assigned to a remote forward operating base. They were the first-up crew and were going to conduct two hours of aircrew training manual training. The crew mix looked good on paper; both pilots were pilots-in-command, one with 920 hours and the other 690 hours. The crew chief and flight medic were experienced in the aircraft and the mission.

The mission was approved by the company commander (a major) and the Marine Corps' higher headquarters for day, night and night vision goggles and was rated low risk on the risk assessment worksheet. The crew would remain within 10 nautical miles of the FOB

while conducting the training. They planned to fly unaided up to a lake north of the FOB for confined area operations, followed by pinnacle operations near another lake to the south. They then would return to the FOB, drop off the passengers, get fuel and continue with an hour of NVG training.

The UH-60A departed two minutes after official sunset. The flight proceeded as planned until they arrived at the pinnacle area next to the lake south of the FOB.

Approximately 45 minutes into the flight during a visual meteorological conditions takeoff from the pinnacle, the aircraft impacted the water in a tail-low attitude. The Black Hawk flipped tail over nose, causing the main rotor blades to disintegrate and ripping the nose off the aircraft. It came to rest inverted in about 10 to 12 feet of water. Fortunately, the PC, pilot and two passengers emerged from the zero-visibility muddy water. Only one of these passengers, a former



ENGAGE!

Unfortunately, two Soldiers were killed during this low-risk mission. Preventable? Yes. How can leaders make a difference? When you're leading on the edge, think about the following:

- Leaders stay engaged
- Leaders are accountable
- Someone always knows
- Never leave a fallen comrade (and not just in the physical sense)

Navy flight surgeon, had previous dunker training. The crew chief and flight medic didn't survive.

Why?

Why did this accident happen? What could the crew have done better to prevent this accident?

■ **Pre-mission and in-flight planning.** Flying over the desert unaided in an area of low contrast 49 minutes after official sunset doesn't pass the common sense test. The crew should've had their NVGs easily accessible since they were first-up MEDEVAC and could've launched on a mission anytime during the training flight. However, their NVGs were stowed in the back of the aircraft.

■ **Flotation equipment.** The crew was in full compliance with Army Regulation 95-1 glide distance requirements for the over-water portion of the flight. The unit didn't deploy with flotation devices based on a METT-T analysis of the operations area. In theater, there are large bodies of water that might pose an over-water hazard based on flight altitudes.

This company received only a partial fielding of the Air Warrior

system at home station. Flotation components weren't issued to the unit, and the unit didn't bring the flotation equipment they had to theater. Commanders need to think through all possible mission profiles and ensure Soldiers are equipped to mitigate those risks.

■ **Underwater egress and water survival.** Would dunker training have enabled the crew chief, who made it out of his seat, to reach the surface? The crew chief's body was recovered away from the main cabin near the nose wreckage. His body was free from all restraints, indicating he'd been physically able to exit the aircraft but drowned while attempting to surface.

Five of the six crewmembers hadn't been trained in underwater aircraft egress. As a result, the crewmembers had problems egressing because of disorientation, water pressure and zero visibility. The one crewmember who'd previously conducted water egress and survival training had no trouble exiting the aircraft. This is an Army-wide problem that's being addressed in Initial Entry Rotary Wing training

but still requires a solution for the rest of Army Aviation.

■ **Crew coordination.** Effective communication and interaction between the crewmembers was another missing tool. Had the pilot not on the controls properly performed his duties as outlined in the ATM, this accident wouldn't have happened. Every crewmember in that aircraft had a vital role to fulfill. It doesn't matter if the mission is in combat or training; a flight crew must always have their game face on. If this had been a combat mission instead of a "low-risk" training flight, the crew most likely would've put the proper emphasis on pre-mission planning and the appropriate level of vigilance required for flying in the desert during reduced light levels. <<

Editor's note: To read GEN Richard A. Cody's full message concerning leader involvement and mission planning in his June 23, 2006, "Thoughts on Aviation Risk Management and Leadership," go to the USACRC Web site at <https://crc.army.mil/Guidance/detail.asp?iData=246&iCat=578&iChannel=15&nChannel=Guidance>.



CW4 EARNEST EAKINS
and STEVE KURTIK
Driving Task Force
U.S. Army Combat Readiness Center

The days are getting longer and warmer, the geese are heading north and the urge to throw your leg over the saddle and fire up your motorcycle is almost too much to bear. As Steppenwolf said, all you want to do is "Get your motor runnin', head out on the highway!" Before you bring that bike back to life, however, there are a few things you must do to get it and yourself ready for the riding season.

First, listen to your MOM. We're not talking about that sweet lady

that cooks Sunday dinner and tells you to pack a sweater in 90-degree weather. Instead, we're referring to your motorcycle owner's manual. If you put your bike in hibernation the way your MOM told you to, just follow its instructions to get your scooter back on the road. You'll have your work cut out for you, though, if you just parked that baby in the corner of your garage or shed.

For those of you that followed the MOM, your prep time will be relatively short. Pull the cover off, fill the gas tank, change the oil and

check the tires for correct pressures and signs of dry rot. Remove any plugs you installed to keep the critters out of your exhaust, carburetor and air filter intake, and then connect the battery following your MOM's procedures. If you didn't put your battery on a trickle charger, you might have problems getting your bike fired up. But between your MOM and T-CLOCS (see poster inside this issue), your pre-ride inspection should cover everything.

Although your bike might be road ready now, you have to check your personal protective equipment to make sure it still fits and is in serviceable condition. Those extra pounds you put on over the holidays might mean a trip to the bike shop to buy a new jacket or leather chaps. This is also the time to make sure your bike is properly licensed and insured. Some of you might have de-registered your motorcycle during the winter to place it on your homeowners' insurance. If so, you'll have to go through the registration and insurance processes again. Do it early so you can get on the road as soon as the weather breaks.

Now you need to get yourself ready for the road. Your first trip shouldn't be from Fort Riley to Daytona for bike week. Ease back into shape and knock the rust off your riding skills by practicing the drills outlined in the Motorcycle Safety Foundation's "Riding Tips" handbook. You can get a free copy of the handbook online at http://www.msf-usa.org/downloads/Riding_Tips.pdf. You might need a refresher course if it's been longer than a few months since your last ride, so contact your local safety office to schedule an experienced rider's course.

Lane position is important when you're on the road. Always position yourself in the lane of travel so you can be seen at the greatest distance possible. You'll also need to be more diligent with your scanning technique and pay particular attention to the road surface so you can spot any cracks or potholes that developed over the winter. Those of you stationed

in colder climates know what I'm talking about: the pothole that bottoms out your suspension, rattles your eyeteeth and leaves you wondering if you bent your rims.

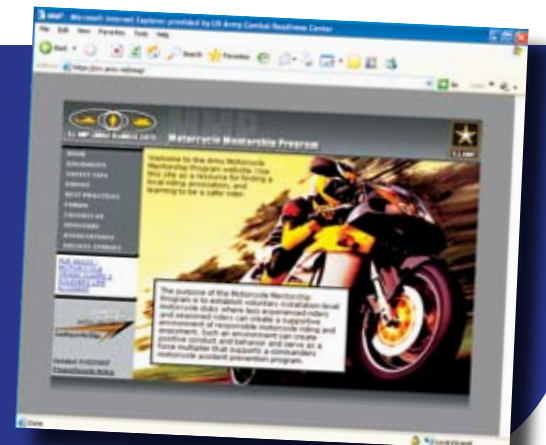
Every May is designated Motorcycle Awareness Month, but there's no reason why we should limit our commitment to safety to just one month a year. The greatest rise in motorcycle purchases and use occurs between

passion for riding, and you also can enjoy group rides and activities. If your installation doesn't have an MMP, contact your safety office to check on starting one.

Local MMPs increase the general public's awareness of motorcyclists by putting groups of Army riders, whether they're active duty, retired or DOD civilians, together on the

» FYI

Before hitting the road, check out the Army Motorcycle Mentorship Program Web site at <https://crc.army.mil/mmp/index.asp>. Use the site as a resource for finding local riding associations and information on how to be a safer rider.



March and April. According to the Insurance Information Institute, more than a million two-wheeled vehicles were purchased in 2005. More than 9 million motorcycles are registered in the United States, and about 33,000 of those are owned by Soldiers. Today's riders are your fellow Soldiers of all ranks and gender and your friends, relatives and neighbors. As the saying goes, it takes two to tango; motorcyclists and motorists share the responsibility of watching for and giving each other room to maneuver.

If your installation has a Motorcycle Mentorship Program, call them up and join the group. The MMP is a great way to meet people that share the same

road. Therefore, it's important to remember some folks still think motorcyclists are "over the edge" people that don't abide by the norms of society. We all know this isn't true and applies to only a very small percentage of the riding population, but be aware that someone is always watching. Your conduct can help elevate riding to a respectable and acceptable form of recreation, so save the wheelies for a sanctioned event.

Whether you're a hard-core or fair-weather rider, machine, mind and body have to be firing on all cylinders to ensure a safe and enjoyable riding season. Warm weather will come and go, so enjoy it while it's here. Live to ride, and ride safe! «

FULL SERVICE, PLEASE

CW3 DAVID MUEHLEISEN
Ground Task Force
U.S. Army Combat Readiness Center

Hot, dry climates often are responsible for the premature failure of equipment components. If not addressed properly, high heat, dust and sand will hinder your equipment's performance and your efforts in conducting maintenance activities. Fortunately, a little preventive maintenance goes a long way in ensuring your equipment stands up to any hazard the desert offers.

The safe conduct of preventive maintenance checks and services is a combat multiplier that will support the successful accomplishment of your missions. Below you'll find some recommendations based on my experience in maintaining equipment in hot weather. Before getting started on any maintenance activities, however, remember to remove all jewelry, button all sleeves and wear appropriate personal protective equipment.

Filters. The heavy dust and sand conditions experienced in most hot climates can clog engine air filters or v-packs in a hurry. Keeping the sand and dust out of filters and air inlet areas will help the overall performance of a vehicle's engine. Compressed air will help blow the dust out, but ensure Soldiers wear goggles and hearing protection while operating an air compressor.

Engines. Internal combustion engines generate a lot of heat in conditions with high ambient temperatures. Ensuring the vehicle's radiator fins are unobstructed and not smashed or blocking airflow will keep the cooling system operating properly. Most organizational tool

rooms have a radiator fin comb that can reshape damaged fins and open the airflow passages. You also should regularly inspect cooling system components such as the surge tank, belts and hoses. Remember, however, never to open the surge tank when the engine coolant is hot. A shower in 200-degree coolant is not the ticket for personal hygiene! Soldiers should wear gloves and eye protection when working around cooling systems.

Lubrication. When performing vehicle maintenance, remember to lube by the lube order. Each vehicle has a lube order that explains lube intervals and the location of lube points. High heat and extended operating hours require operators to reapply grease more often. A clean rag, coveralls and eye protection will ensure you get the job done safely.

Tires. Maintainers must inspect tires during PMCS. Worn tread or sidewall damage can lead to tire failure during a mission. Sidewall damage decreases the structural integrity of the tire and can result in rupture, especially under high heat conditions. Proper tire pressure also is a

critical factor in maintaining vehicle stability. In fact, just a 20-percent disparity in tire pressure can mean the difference between a vehicle that's under control or out of control.

Underinflation or overinflation can cause tires to wear unevenly and also results in poor fuel mileage. Tire air pressure should be checked weekly, but remember split-rim or multipiece wheels require special equipment and training. For more information and a link to Occupational Safety and Health Administration charts on how to service these wheels, visit the Tire Industry Association's Web site at <http://www.tireindustry.org/cts.asp>.

Batteries. If neglected, vehicle batteries are very susceptible to heat damage. Hot, arid climates can cause battery electrolyte levels to evaporate quickly. Use only distilled water when refilling a battery's fluid levels. Cleaning and tightening battery holds and applying a small amount of grease to battery clamps is the best defense to ensure battery life longevity.

Glass. The addition of armor plates reduces visibility from the cab for

both the driver and truck commander, so clean and serviceable ballistic glass is a must. When applicable, only clean ballistic glass with mild detergent and warm water. Don't scratch the inner surface or apply stickers or labels to ballistic glass. When cleaning windows, give mirrors and lights a quick wipe as well.

Cooling systems. Most of the Army's wheeled vehicles now have aftermarket air conditioning installed. Inspecting and servicing these systems can help keep crews 10 to 20 degrees cooler during missions. The systems are simple to inspect; tight belts and clean filters are the only operator checks. Compressed air is the best remedy for cleaning dirty filters or blowing out fans. If a system doesn't blow cool air, see the maintenance reps. Remember to keep your hands away from belts and pulleys while the equipment is running and also watch for the condenser fins, which are sharp and can cut skin easily.

Generators. Preventive maintenance isn't for vehicle components only; power generators require the same attention. If

your unit has two of the same-type generators, alternate their use with a 12-hours-on, 12-hours-off schedule and PMCS them often. Put generators in the shade whenever possible; the cooling effect might help their performance. Additionally, load the generator at 80 percent to prevent "wet stacking," or a buildup of fuel that can damage the generator's engine.

Don't forget to ground! Achieving a good ground in desert environments can be difficult, but it's critical to preventing shock hazards. In the August 2005 edition of *PS*, the article "Grounding Right in the Desert" offers several techniques to overcome this issue. Slide hammers are the proper tool for hammering ground rods.

Maintenance activities in extremely hot weather are just around the corner. By following the cautions and warnings in your equipment's technical manuals, using proper personal protective equipment for the mission and employing some common sense, you can prevent needless accidents from affecting you and your fellow Soldiers. ◀◀



FYI

Planning to perform some preventive maintenance on your vehicle? If so, consult the chart below to see what PPE you should wear for the job.

Activity	Acid-resistant Apron	Work Gloves (hazard dependent)	Goggles	Ballistic Eye Protection	Helmet (Army Combat Helmet or Kevlar)
Battery Maintenance	●	●	●		
Camouflage/Tarp Erection		●			●
Grounding Rods		●		●	●
Compressed Air		●	●		

a real Witch's Brew

BOB VAN ELSBERG
Editor, Knowledge
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and
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“Wow ... what a mess!” I thought as I looked

at the bathroom of the dry cleaners where I worked part-time. Latrine duty was my least favorite chore, the dirtiest of the many dirty jobs that had to be done at the cleaners.

I wasn't relishing the task. As I looked at the stains, I figured using bleach cleanser would be the only way to get them out. I grabbed a wet sponge, dipped it in a bucket of hot water and cleanser and started scrubbing, but to no avail. Then I had an idea. I had a bottle of ammonia, something I'd seen my mom use at home. Why not mix the bleach and ammonia together? I figured the combination would create a high-powered cleaner sure to remove even the toughest stains.

I poured some ammonia into the bucket and began scrubbing again. But before long I was feeling dizzy and my lungs were hurting. When I walked out of the bathroom for some fresh air, the owner rushed over to see what was wrong. She was shocked when I told her what I'd done. I'd unwittingly concocted chloramine, or chlorine gas, a “witch's brew” similar to the phosgene gas used to kill Soldiers in World War I. I'd almost gassed myself! All it took was mixing a couple of household products with a lot of ignorance.

Chemicals can be hazardous because of their toxicity, flammability, corrosiveness or how they react when combined with other substances. Toxic chemicals such as fungicides or insecticides can damage skin and other tissue and lead to serious injury or death. At low temperatures, flammable substances including hair sprays, solvents, adhesives and paint thinners can spontaneously combust. Corrosive chemicals such as cleaners for ovens, drains and toilets and battery acid can damage your skin on contact.

Reactive substances including dishwashing detergent and pool chemicals typically contain chlorine. When exposed to shock, pressure, temperature, air, water or

other chemicals, they'll polymerize vigorously (the process where one or more small molecules form larger molecules). That's what happened when I mixed the bleach and ammonia.

Every day we're exposed to chemicals used for a variety of purposes in and around our homes. We have air fresheners and products for cleaning kitchens and bathrooms, washing dishes and removing stains from carpets and furniture. In our bathrooms we have deodorants and hair care products. For pets we have flea and tick killers. We store stain, caulk, sealers, adhesives and other home maintenance items in our garages along with lawn care chemicals such as fertilizers, weed killer and pesticides. For our vehicles and fuel-powered tools, we store things such as gasoline, brake fluid, battery acid, lubricants and degreasers. Homeowners with pools typically keep chemicals such as chlorine, algaecide and pH balance in their garage or storage shed.

Protecting yourself and your family from the hazards posed by these products is simple; it just takes a little time and attention. First, thoroughly read product labels to understand how to use them safely and what protective equipment

SHOULD A POISONING OCCUR:

- Stay calm
 - Immediately call your poison control center or the AAPCC's hotline and have the following information ready:
 - Victim's condition, age and height
 - Name of the product and ingredients
 - How much of the product was taken
 - Time the poisoning occurred
 - Your name and telephone number
 - Follow the poison center's instructions
- Prevention tips**
- Keep all household poisons and medicines in their original, labeled and child-proof containers.
 - Lock poisons and medications out of the reach and sight of small children.
 - Be as careful with non-prescription medicines as with prescription medications. Never refer to them as candy or take them in front of children.
 - Never leave children alone with household products or medications. If you're using a product and must answer the telephone or door, take the child with you.
 - Return household and chemical products to safe storage immediately after use.
 - Know which plants can be poisonous and keep them away from children. Contact a local nursery or your state's poison center to find out which plants are safe.
 - Never store household cleaning products in the same place you store food.
 - Never place poisonous products in a container that once held drinks or food.

might be required. Second, inspect your house, storage closet and garage for proper storage conditions. Ensure substances that are dangerous when mixed aren't stored side by side. Also make sure cabinets and doors are secured properly to prevent children or pets from opening them.

Finally, there are some important numbers you need to keep next to

your phone. If you have a poisoning emergency, call the American Association of Poison Control Centers' toll-free hotline at (800) 222-1222 for immediate help. In addition, have the number for your family doctor and nearest hospital readily available. Each state has a poison control center; to find the one for your state, visit the AAPCC's Web site at www.aapcc.org/findyour.htm. «

» FYI

For more information on poison prevention, visit the AAPCC's home page at <http://www.aapcc.org/> and click on “Poison Prevention & Education.”



It was early on a Monday morning when five Soldiers, all assigned to the same unit, piled into one Soldier's car for the drive to a major airport in an adjacent state. They were starting block leave and eager to catch their flights home. The Soldiers jammed five duffle bags into the trunk and got inside the vehicle, holding additional luggage on their laps or on the floorboards between their feet.

TOO HEAVY+TOO FAST=THREE DEAD

U.S. ARMY COMBAT READINESS CENTER

Although the car was a mid-size luxury model, the Soldiers had exceeded its load limitations. With three people in the backseat and more than 350 pounds of luggage in the trunk, the vehicle's weight distribution shifted toward the rear. This reduced front-tire traction and altered the vehicle's handling and stability.

The Soldiers had received a safety briefing from the rear detachment NCOIC during morning formation. The briefing addressed driving techniques, speeding, drunk driving and driving while fatigued. After they were finally released on leave, the Soldiers wasted no time getting on the road.

They had to cover a lot of miles quickly to make it to the airport on time. The state highway they started out on wasn't the best, being narrow, poorly maintained and limited to 55 mph. The intermittent rain showers they hit didn't help matters. However, as they crossed the state line, the road improved significantly. The broad,

two-lane road allowed drivers to go 70 mph during daytime hours.

After a brief stop at a gas station, the five Soldiers got back on the road and headed west toward the city where the airport was located. The road was wet from the occasional rain showers they were still encountering, and the driver had his lights on and his wipers going. They'd gone about eight miles when the road curved slightly to the right and descended, providing a short passing zone for westbound traffic before quickly entering a no-passing zone and an uphill grade.

While the Soldiers' vehicle was in the passing zone, another driver swept past and then swerved back into the westbound lane, cutting their car off. The Soldier driving the vehicle panicked and slammed on the brakes, causing the car to skid right and then left. As the car slid, the driver hit and released the brakes but failed to regain control.

The car slid across the oncoming

lane and down an embankment before skidding across a muddy, sparsely grassed shoulder and up a slight incline into some large trees. The front passenger side hit a tree, causing the car to spin and hit another tree on the driver side. The vehicle wound up about 50 feet in a forest, far enough off the road to not be seen easily by passing traffic.

After briefly losing consciousness, the driver awoke, got out of the car, checked the other passengers and made his way to the road to get help. Two truck drivers stopped on the shoulder and went into the woods toward the crashed car. Another motorist stopped and called 911 for assistance. State troopers and emergency medical services were dispatched quickly to the accident scene, where fire department personnel used their Jaws of Life equipment to free some of the Soldiers from the badly smashed car.

The driver, who had suffered only minor injuries, was treated and taken

to a local hospital. The truck drivers had gotten the driver-side rear passenger out of the vehicle and laid him on his back on the ground. Paramedics treated the Soldier for difficulty breathing and prepared him for air evacuation to a hospital.

Unfortunately, the three other Soldiers didn't survive. The right-front passenger was found a few feet from the car. He was lying prone on his door, which had been torn from the vehicle during the accident. The right-rear passenger was crushed into his door and rested in a fetal position. The rear-center passenger's feet were touching the ground through a hole that had been ripped in the right-rear passenger's floorboard. Although the five Soldiers had worn their seat belts, it wasn't enough to save all of them during this violent, high-speed crash.

So what killed them?

Driver inexperience. The driver improperly applied his brakes during the accident sequence. His vehicle was equipped with anti-lock brakes, but the driver pumped them instead of applying firm, steady pressure to the pedal and steering through the situation, sending the car out of control. The vehicle's overloaded state also made it far less controllable when the driver attempted to brake.

Speed. The accident occurred 101 miles into the trip, but the Soldiers had been on the road for only an hour and 10 minutes. To cover that distance in such a short time, the driver had to average a speed of 86 mph. Taking into account the stop lights in two towns along the route and the brief gas station stop, the driver must have accelerated well above 86 mph on some sections of the road. This action violated the 70-mph speed limit and also was far too fast for the wet road conditions.

Final thoughts

Although seat belts and crush zones in modern vehicles can save the lives of passengers, there is a limit when speed is involved. For every increase of 10 mph, impact forces are doubled during a crash. There comes a point when no vehicle can withstand the impact and remain intact. Also, the g-forces on passengers, even those properly restrained by seat belts, can be more than the human body can survive.

The Soldier who caused this accident was properly trained and licensed and had just received a safety briefing. He has no excuse. Likewise, the passengers were responsible to speak up for their own safety but didn't. Sadly, in the end, three of them paid for that silence with their lives.◀◀

DON'T FLIP YOUR LID

BOBBY J. PIIRAINEN
U.S. Marine Corps

Working at a treatment storage disposal facility might not be the most glamorous job, but what goes on inside is pretty important business. Where do you think all that hazardous waste we create ends up? What the job lacks in excitement, though, is more than made up by the potential for danger, as I found out firsthand.

I'd just arrived at my job as a hazardous waste handler and was on my way to change into my work clothes. As I approached the changing room, I saw a drum we'd picked up the previous day sitting on a pallet. What caught my eye was the drum had started to "football," or bulge, at both ends.

Being a first responder for the base, I immediately recognized this as a potential problem and decided to investigate. One of the first things you look or listen for when a drum takes this shape is pinging. If the drum begins to ping, it means the metal is starting to fatigue and might burst. If that happens, you could be facing anything from a normal spill to a full-blown disaster, depending on the material contained in the drum.

There wasn't any pinging, so I moved on to the second warning sign, which is whether the drum is hot. If it's hot, a chemical reaction probably is happening inside the drum, which can lead to a real problem. I carefully walked up to the drum to check for heat but felt none.

Once I determined the drum

wasn't going to blow, I pulled the paperwork out to see what it contained. The only substances listed were waste oil and paint. I figured the bulging probably was due to someone overfilling the drum and not leaving a vapor space. It was a warm morning, so it made sense this was the problem. I decided there was nothing more to do than let the extra air out, so I put the paperwork back on the drum and continued to the changing room.

It took me less than five minutes to get changed, but as I finished I started thinking about that drum again. There was something about it that gave me an uneasy feeling, and I wanted to investigate more. I left the changing room and walked back toward the drum. I was about 30 feet from it when the top blew.

You must understand this container was a bung-type drum, and its top was welded on tight. The only way to put material or waste inside this type drum is to unscrew one of the two bung tops. The force of the blast sent the drum's top about 50 feet in the air. I could feel the force of the explosion from where I was standing.

When it finally dawned on me what had just happened, I decided to leave work a little early. What would've happened to me had that drum exploded while I was standing over it? The outcome surely would've been bad. Since that day, I've made it a point to tell my story whenever I get the chance. Hopefully my experience will keep someone from making the same mistake ◀◀

As GOOD as it GETS

U.S. ARMY COMBAT READINESS CENTER

Execution of rollover drills and situational awareness turned a potentially deadly rollover event into a successful survival story for three Soldiers when their Bradley Fighting Vehicle rolled into a canal in Iraq.

SSG Logan Wallace, Bradley commander; SPC Mark Hoiland, gunner; and SPC Ray Ness, driver, were able to successfully exit their BFV after the road on the bridge they were crossing gave way, causing the vehicle to slide and overturn before coming to rest upside down in the canal.

"We were in a vehicle convoy on a night mission," said Wallace. "We saw the crossing and proceeded to make the turn over a canal."

With knowledge of tactics, techniques and procedures specifically developed for the operational terrain and background experience through training and rollover drills, Wallace and his crew made the proper preparations before crossing the bridge.

"When the road started to

break away, causing us to slide into the canal, I yelled over the intercom system that we were sliding," said Ness. "SPC Hoiland then yelled 'rollover.'"

"We slid in and tipped upside down," said Hoiland. "The BFV hit the bottom and water filled the turret."

While water was filling the vehicle, the three Soldiers immediately began trying to exit the vehicle and made certain not to leave a fallen comrade behind.

"I was able to turn myself around upwards after the water filled the turret," said Hoiland. "I then yelled for SSG Wallace and started pulling on him because he was still upside down."

"I was able to get down in the turret of the Bradley before we were upside down but was forced into the BC's hatch," said

Wallace. "I was face first in the mud and water. I tried to get free and upright but was stuck in the mud and my IBA (Interceptor Body Armor) was catching on something. Water filled the turret very fast and I didn't know the fate of my crew members. I continued to struggle to free myself from the river bed, holding my breath and thinking time was running out. I started taking a little water into my lungs and then I heard SPC Hoiland screaming my name and pulling on my IBA until he was able to get me upright."

While Hoiland was freeing Wallace and getting his head above the water, Ness was also taking action.

"I was stuck up in the driver area," said Ness. "I finally freed myself and made my way through to the back troop area of the BFV. Once I got back in the troop compartment

and saw that the gunner's (turret shield) door was not open, I heard SPC Hoiland yelling that he couldn't get the turret door open because he was pinned against it. I then felt for the handle to the gunner's door and pulled it open."

The driver and gunner of the BFV that had been following the Soldiers' vehicle dove into the water to assist them out of the water.

"The Soldiers knew the TTPs and procedures that helped save their lives," said MAJ Michael Murray, the battalion safety officer. "By placing the turret in the 12 o'clock position, part of the training and preparation to cross canals, it allows the Soldiers to get the door open. Otherwise it could be blocked. Additionally, the crew conducted their rollover drill as the vehicle entered the water. That is training saving lives."

Training and proper

execution of TTPs also had the three Soldiers securing all their equipment as part of pre-combat checks.

"This prevented the vehicle from being cluttered and having items that could have hit the crew members as the vehicle overturned," said Murray. "The 'hell hole' was clear, which allowed Ness to get out as well as get back to open the door."

According to Army statistics, rollovers have been decreasing. This reduction is directly attributed to improved TTPs such as reduced speeds, increased rollover drills and leaders ensuring Soldiers are aware of hazards.

Comparing fiscal 2006 to fiscal 2005, the Army had an 82-percent reduction in drowning fatalities resulting from rollovers.

"These Soldiers did everything right," said Murray. ◀

TRAVEL RISK TRiPS PLANNING SYSTEM



TRIPS FOR YOUR TRIPS!

This March, Soldiers will notice something different about the tool they've come to depend on for assessing risk during POV trips. What was formerly known as ASMIS-2 is now the Travel Risk Planning System, or TRiPS, and it's been adopted across the Department of Defense for use by the Navy, Marines, Coast Guard and Air Force. The name change and expanded reach doesn't change the tool's value, however. Soldiers will

continue to input and receive hazard and risk mitigation information based on their trip specifics, including vehicle type, driver age, destination, seat belt use and more. However, supervisors will have more oversight thanks to a new feature that allows them to view the activity of their subordinates two levels down, thereby expanding leadership engagement and awareness.

TRiPS was implemented in the Army as ASMIS in 2004 and to date, Soldiers

have completed more than 1,783,000 assessments with only six fatalities reported during assessed trips. In the year since the Navy released TRiPS, no fatalities have been reported among the nearly 30,000 Sailors registered for assessments. These statistics show fatal POV mishaps might be less likely among service members who use the tool. For more information or to register for TRiPS, visit the U.S. Army Combat Readiness Center's Web site at <https://crc.army.mil>. ◀



» AVIATION



CLASS C **D Model**
■ Aircraft was ground taxiing on the runway when its rotor wash caused damage to a parked DC-3.

CLASS D
■ The pilots felt a high-frequency vibration in the forward transmission during cruise flight and returned the aircraft to base for further inspection. The vibration was present on the ground, although less noticeable. After

shutdown, maintenance personnel determined the #1 FLT HYD pump was failing and replaced it.



CLASS D **E Model**
■ The crew noticed the No. 2 aircraft pylon hydraulic access panel was missing during the post-flight inspection. The inspection revealed the leading edge camlock fastener on the access panel had failed, resulting in the panel separating from and striking the airframe during flight. The aircraft was released for repair.



CLASS B **D(R) Model**
■ Aircraft experienced an overtorque condition during out-of-ground effect hover.

CLASS C
■ The aircraft suffered damage during an M4 weapons test fire when some of the rounds contacted a main rotor blade.

» **DO YOUR PILOTS-IN-COMMAND CONDUCT CREW AND PASSENGER BRIEFS THAT INCLUDE DISCUSSION OF WEAPONS USAGE AND EFFECTS DURING FLIGHT OPERATIONS?**



CLASS A **H Model**
■ Four crewmembers and five civilians suffered injuries when their aircraft contacted wires during flight and struck a mountainside. The aircraft was destroyed.

» **DO YOU CONDUCT ADEQUATE PRE-MISSION PLANNING AND USE A CURRENT HAZARD MAP FOR RECONNAISSANCE AND NAVIGATION?**



CLASS A **L Model**
■ Three crewmembers suffered fatal injuries when their aircraft impacted the ground during a night vision goggle training flight.

» UAS



CLASS B
■ The UAS crashed and was destroyed during return to the launch and recovery site.

■ Engine rpm dropped abruptly as the UAS proceeded up the launcher, preventing the aircraft from maintaining flight. The UAS glided under minimum power for 525 feet and crashed into a motor pool, causing extensive damage to the aircraft.



CLASS C
■ While conducting a surveillance reconnaissance mission, the UAS operator lost all power on the ground control unit. The GCU came back up and reset with no GPS lock or light setting. In addition, the aircraft did not return to its programmed

rally point nor respond to manual controls. The UAS crashed and could not be located.

» GROUND



CLASS A
■ A Soldier was killed when the HMMWV he was riding in rolled over. The Soldier, who was serving as the gunner, was pinned underneath the vehicle. The accident occurred in the early morning.

» **ARE YOUR VEHICLES RETROFITTED WITH THE IMPROVED GUNNER RESTRAINT SYSTEM?**

■ A Soldier suffered fatal injuries when the FMTV he was driving overturned. The Soldier was attempting to drive around an impassable portion of roadway when the accident occurred. The Soldier was evacuated for treatment but died at the aid station. Seat belt use was not reported. The accident occurred in the mid-evening.

CLASS B (DAMAGE)
■ Two Soldiers suffered minor injuries when their M978A2 HEMTT fueler rolled over. The driver was operating the vehicle on an unimproved surface at a high rate of speed when he attempted to make a turn. The vehicle's excessive speed, combined with the weight of the JP8 fuel it was carrying, caused it to fishtail and overturn. The driver and vehicle commander were evacuated to a hospital and treated for their injuries. Both Soldiers were wearing their seat belts, Kevlars and eye protection. The vehicle suffered a bent frame and was deemed a total loss. The accident occurred in the mid-evening.

ARMY
» AIRCRAFT
LOSSES
FY02 to Present
thru Feb. 28, 2007



AH-64A/D	13/44
U/MH-60L	9/24
C/MH-47	6/14
OH-58D	8/21

TOTAL 36/103

ARMY
» GROUND
LOSSES
FY07
thru Jan. 2007



AMV	7/7
ACV	5/3
PERSONNEL INJURY	14/14
WEAPONS HANDLING 3/3	FIRE/EXPLOSION 0/0

TOTAL 29/27

Personnel Injury



CLASS A

■ A Soldier suffered a fatal gunshot wound to the head during an enemy engagement. Friendly fire is suspected. The accident occurred in the early morning.

➤ **ARE YOUR SOLDIERS PRACTICING PROPER WEAPONS HANDLING?**

■ A Soldier died after becoming ill while participating in a physical training test. The Soldier was evacuated to a local hospital before being transferred to a heart and lung center, where he was pronounced dead. The accident occurred in the mid-morning.

■ Two Soldiers drowned when they were caught on a lake in bad weather. The Soldiers were fishing in a small boat, and their bodies were found three days later. Neither Soldier was wearing a life jacket.

➤ **HAVE YOU TALKED WITH YOUR SOLDIERS ABOUT THEIR OFF-DUTY ACTIVITIES AND HAZARDS?**

■ A Soldier drowned while body boarding. His body was discovered in shallow water. No further details were reported.

CLASS B

■ A Soldier suffered a permanent partial disability when a .50-caliber round detonated inside the chamber of the weapon he was operating. Shrapnel struck the Soldier's leg. The accident occurred in the late evening.

■ A Soldier suffered a permanent partial disability when the taxi he was riding in was

struck by a pickup traveling on the wrong side of the road. The Soldier's spleen was removed during subsequent surgery.

CLASS C

■ A Soldier was injured during range training when his .50-caliber weapon misfired and the round exploded. The Soldier was knocked backward and fell into a 5-foot-deep foxhole, fracturing his skull and cutting his face and head. No shrapnel was found in the Soldier's head. The accident occurred in the mid-morning.

➤ **ARE YOUR SOLDIERS WEARING THE APPROPRIATE PPE?**

■ A Solider suffered an eye injury while conducting an area security mission. The Soldier was moving toward the rear of a vehicle when the M249 gunner engaged a target. The Soldier was struck in the right eye by a blank round after it was ejected from the weapon. The Soldier was transported to the emergency room, where he received two sutures in his cornea and was hospitalized for four days. The accident occurred in the mid-afternoon.

■ Three Soldiers suffered minor injuries when a burlap sack containing a substance believed to be a homemade explosive discharged. The Soldiers were examining the sack when some ashes from one of the Soldier's cigarette ignited the substance. Two of the Soldiers were treated at the troop medical clinic and returned to duty. The third Soldier was transported to the hospital for an eye injury and kept overnight for observation. He returned to duty the following day with a 30-day duty restriction. The accident occurred in the early afternoon.



CLASS A

■ A Soldier was killed when his POV left the road and struck a tree. The Soldier was wearing his seat belt.

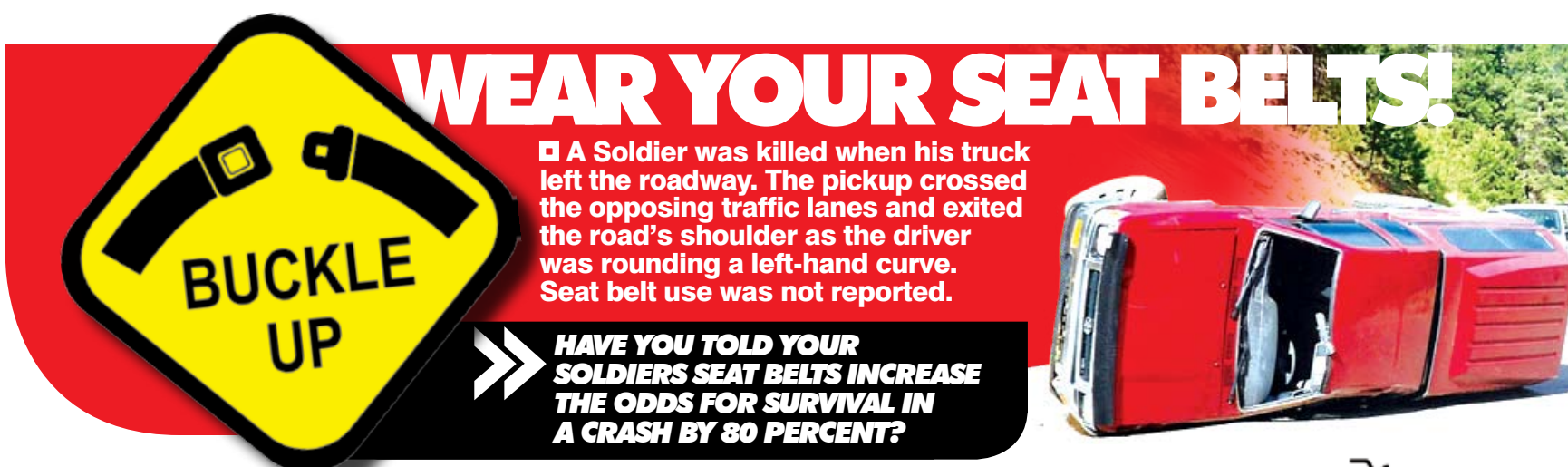
■ A Soldier suffered fatal injuries when his vehicle left the road, struck a culvert, became airborne and landed in a ditch.



thru Jan. 2007		Class A accidents/Soldiers killed	
CARS	25/16		
VANS	0/0		
TRUCKS	15/11		
MOTORCYCLES	29/8		
OTHER*	10/2		

*Includes tractor-trailers, unknown POVs and bicycles

37
TOTAL DEATHS
06 FY06: 30 3 year average: 34



■ A Soldier was killed when his truck left the roadway. The pickup crossed the opposing traffic lanes and exited the road's shoulder as the driver was rounding a left-hand curve. Seat belt use was not reported.

➤ **HAVE YOU TOLD YOUR SOLDIERS SEAT BELTS INCREASE THE ODDS FOR SURVIVAL IN A CRASH BY 80 PERCENT?**

The Soldier was en route to his duty station for weekend drill. Seat belt use was not reported.

■ A Soldier died when his POV crossed a median and overturned on an icy road. The Soldier was traveling to his leave location and was wearing his seat belt.

■ Two Soldiers were killed when the POV they were riding in hit a tractor-trailer. The driver, also a Soldier, was attempting to pass the tractor-trailer when he lost control of the vehicle. Seat belt use was not reported.

■ A Soldier suffered fatal injuries when his POV rolled over on an interstate highway. The Soldier reportedly fell asleep at the wheel and when the vehicle rolled, its roof caved in on the Soldier and his brother. Both the Soldier and his brother, who suffered minor injuries, were wearing their seat belts. The Soldier is believed to have been behind the wheel for three hours and had driven about 180 miles when the accident occurred.

➤ **DO YOUR SOLDIERS DISCOUNT THE VALUE OF A GOOD NIGHT'S SLEEP?**

■ A Soldier suffered fatal burns when his POV caught fire after a single-vehicle accident. The Soldier was trapped

inside the car and pronounced dead at a local hospital.

■ A Soldier was killed when his pickup drifted off the road, spun around, overturned, struck an electrical post and caught fire.

■ A Soldier died when his truck hit an oncoming tractor-trailer. The Soldier was traveling eastbound when he lost control of the pickup, which crossed the median into the opposing lane. The accident happened after sunset during adverse weather conditions. Seat belt use was not reported.

■ A Soldier suffered fatal injuries when his pickup hit an oncoming tractor-trailer. The Soldier was traveling on an interstate highway during bad weather when he lost control of the truck. Seat belt use was not reported.

■ A Soldier was killed when his truck left the roadway. The pickup crossed the opposing traffic lanes and exited the road's shoulder as the driver was rounding a left-hand curve. Seat belt use was not reported.

■ A Soldier died when his pickup rolled over several times after being hit by a bus on a freeway onramp. The Soldier was thrown from the vehicle and pronounced dead at the scene.



CLASS A

■ A Soldier died when his motorcycle collided head-on with a pickup. The Soldier was attempting to pass another vehicle on the right when the motorcycle crossed the centerline. The Soldier was wearing his helmet and required personal protective equipment.

■ A Soldier suffered fatal injuries when his motorcycle overturned and hit a concrete pole. The Soldier was rounding a curve at the time of the accident. He was properly licensed and wearing required PPE.

CLASS B

■ A Soldier suffered head injuries resulting in a permanent partial disability when he was thrown from his bike. The Soldier lost control of the motorcycle when a POV entered his path. The Soldier was properly licensed and wearing required PPE.

CLASS C

■ A Soldier suffered a dislocated shoulder when his motorcycle crashed in a ditch. The Soldier was riding his motorcycle in family housing at 30 mph in a 45-mph speed zone after dark. He reportedly misjudged the angle of a turn and attempted to make it too fast, resulting in the accident. The Soldier was properly licensed and wearing required PPE.

IT ISN'T HOW LITTLE YOU KNOW...

IT ISN'T HOW LITTLE YOU KNOW
THAT GETS YOU IN TROUBLE.

IT'S BELIEVING THAT WHAT LITTLE YOU KNOW
IS ENOUGH TO KEEP YOU OUT OF TROUBLE.



U.S. ARMY

ARMY STRONG.



U.S. ARMY COMBAT READINESS CENTER

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own^{the}
EDGE

Leading on the Edge